the general body of fellows as to the introduction of the amended statute, and not to proceed with any recommendation for election under it before thorough reconsideration of the whole question. Fear was expressed that the amended statute might result in the election under (A) of "a politician, not at all necessarily of high distinction, who may be engaged in particular legislative or other public activity, on the ground only that his election would assist the work of the society," and under (B) of generous donors to the society or other scientific institutions, and the chief permanent officials of all departments of State concerned with scientific matters.

At the request of the memorialists, a special general meeting was held on June 7 to reconsider the amended statute, and the following resolution, moved by Sir David Bruce and seconded by Sir E. Ray Lankester, was carried after a long discussion :—"That this meeting is of opinion that the council will serve the best interests of the society by restoring Statute XII. to the form it had before the change made in it by the council on November 2, 1916, and by postponing further consideration of the statute relating to the election of fellows until after the termination of the war."

The action of the council in endeavouring to provide for the election of a few fellows on a broader basis than at present exists is thus practically undone. It was thought by some fellows that opposition to the new statute might have been met by a resolution to suspend elections under it during the war, and to leave any question of rescinding it until after the war; but the meeting decided to refer back to the council the whole question of amendment. A new council is, however, now in office, and the considerations which led to the recommendation of the amended statute will have to be gone over again in detail for the benefit of the new members when the resolution comes before the council.

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## *THE ANIMAL SYMBOL OF THE EGYPTIAN DEITY, SET.*

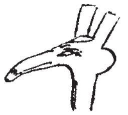
M. G. DARESSY has been writing[1] concerning the long-disputed question as to the identity of one of the animals which the old Egyptians selected as the symbol of their malevolent deity, Set, or Seth. Among creatures suggested as intended by the Egyptian artists have been the jackal, hare, oryx, and okapi, but all these assignments have been abandoned.

Two years ago Dr. Schweinfurth decided upon the orycterope, or anteater, the Erdferkel of the Sudan and Aardvaark of the Boers, because of the almost absolute resemblance of its head and snout to the Set quadrupeds.

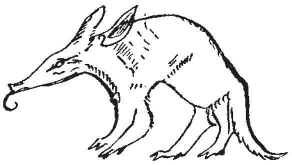
The long legs and tail shown in Egyptian drawings, the tail often depicted vertically erect, and with double tufted end, render this attribution difficult, so M. Daressy has reviewed the question from the archæological side, summarising important Egyptian writings, and citing the delineations of the Set animal by their draughtsmen. From the literary side he illustrates the question from myth and stories of Set, of whom the creature was the crest, totem, and symbolic hieroglyph.

In the myths, when Set, with his name changed to Souti, became ally, instead of foe, of Horus, he was deemed lord of Upper Egypt, as Horus was of Lower Egypt and the Delta. This suggests that Set may have been a ruler of Upper Egypt, who warred with Osiris, King of Lower Egypt, and later also with Horus.

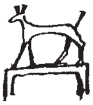
Although the myths speak of Set as god of evil, darkness, and the sterile deserts, the fact of his in some cases being said to have been reconciled to Horus, though he had assassinated Horus's father, Osiris, caused Set to be semi-deified, and a few shrines for his worship have been found as Souti. At Edfu he was a crocodile, though never worshipped under that type, crocodile deities such as Sobk and Pnepheros being different concepts. Set took other evil animal forms, such as the boar and swine, creatures abhorred in many religions. M. Daressy argues that the Set animal is really a creation of the imagination, the object of the design being to depict a creature so constructed as to be impotent to destroy Horus. If this was so, it is futile to search for the creature in either the existing or fossil fauna of Africa.



Egyptian drawing of head of Set animal.



*Orycterope aethiopicus.*



Set Pharaonic crest.

M. Daressy thinks the design embodies all the most opposite characters to those of a boar. If so, the animal is merely a fantastic design to symbolise the evil aspect of the deity.

But once in Egyptian history a Pharaoh, instead of using the falcon, which was their solar Horus dynastic crest, for his totem, in the Second or Third Dynasty employed for his honour the Set animal. This king was probably ruler of Upper Egypt solely, but his successor, to assure his subjects that he was under the tutelary protection of all Egypt's deities, used the double crests of the Set animal and Horus falcon, and the Set one was never used again for a royal symbol. It is very improbable this would have been done if the Set figure was a sort of serio-comic invention.

It should be borne in mind that the ancient Egyptian animal-gods were (unless Set is an exception) real existing creatures. The Sphinx was not a god, or even totem of any particular deity. In the tombs at Beni Hassan various fantastic animals are depicted as denizens of the desert, and real ones also. The Set creature is there placed between a real and an imaginary one. An interesting fact is that the greater the antiquity of the figure, the less abnormal are its features from those of a dog, or jackal, or some allied species. Thus on some of the Serekh figures containing the name of the early dynasty Pharaoh, Perabsen, the Set quadruped is identical with old Egyptian drawings of jackals, which were sacred to Anubis excepting for its long erect tail, which has not the forked ending introduced later.

Head of Set in Spink collection.

This Pharaoh only bore the Upper Egypt crown, so the creature, if a real one, may not have existed in Lower Egypt, and Set himself, as noted, seems to have ruled in Upper Egypt only.

It is just possible that remains of a member of the

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[1] M. Daressy's article may be found in the Bulletin de l'Institut Français d'Archéologie Orientale, tome xiii., pp. 77-92.

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Canidæ family now extinct may be found that will explain the anomaly.

Unfortunately, the prehensile lips and snout, so well indicated by the unique and very ancient bronze head which Messrs. Spink, of St. James's, have kindly permitted us to publish, would not be indicated by any of the bones.

It may be that the animal was very scarce, and that after its association with the detested deity it was exterminated by the Horus-following, orthodox Egyptians.

JOSEPH OFFORD.

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## TECHNICAL OPTICS.

THE establishment of a Department of Technical Optics at the Imperial College of Science and Technology, and the appointment of Mr. F. J. Cheshire as the director of the department, were announced in NATURE of May 24 (p. 257). The report of the Board of Education for the year 1915–16 just issued (Cd. 8594, price 6*d.*) includes the following reference to this subject:—

After many years of discussion the establishment of a Department of Technical Optics is at last assured, and the Board desires in this connection to express its appreciation of the action of the London County Council, to whom the realisation of the scheme is largely due. The scheme involves the co-operation of the Imperial College of Science and Technology at South Kensington and the Northampton Polytechnic Institute in Clerkenwell. The more elementary instruction will be given at the Northampton Polytechnic Institute; the advanced full-time courses, and most of the research work, will be centred at the Imperial College. The work in technical optics at both institutions will be under the control of a director, who will be a professor of the Imperial College, and will be given the position of honorary head of a department in the Northampton Institute.

The governors of the Imperial College have appointed a Technical Optics Committee to manage under them the work for which they are responsible; and the London County Council has appointed the same committee to advise it as to the work to be done at the Northampton Institute. The Right Hon. A. H. D. Acland, who is chairman of the Executive Committee of the Imperial College and a member of the Committee of His Majesty's Privy Council on Scientific and Industrial Research, has consented to act as chairman of the Technical Optics Committee. This committee will contain representatives of the Admiralty, the War Office, and the Ministry of Munitions, and also of employers and workers in the trade.

At the outset the annual cost of maintaining the new scheme is estimated to be not less than 5000*l.*, while 5500*l.* is needed for alterations and equipment. Of these sums the London County Council is prepared to find 2000*l.* a year (including 1000*l.* for the work at the Imperial College, and an increase of not more than 1000*l.* in its maintenance grant to the Northampton Institute), together with 750*l.* towards the necessary equipment at South Kensington and 2500*l.* for alterations and new equipment at Clerkenwell. The Board of Education will make an additional annual grant of 2000*l.* to the Imperial College as from April 1, 1917, and a capital grant of 1500*l.* for equipment, while the extended provision for technical optics at the Northampton Institute will be taken into account in fixing the amount of the Board's block grant to that institution under the Regulations for Technical Schools. The Department of Scientific and Industrial Research is prepared to make a grant of 1000*l.* a year for five years to the Imperial College and an equipment grant of 750*l.* in respect of the research work which will be undertaken by the new Institute of Technical Optics.

Mr. Frederic J. Cheshire has been appointed head of the new department at the Imperial College for a period of five years, with the title Director of Technical Optics and Professor of Technical Optics at the Imperial College. Mr. Cheshire's long experience and great ability in optical matters practically ensure a successful beginning. He has been associated with optical instruments for many years at the Patent Office, and since the formation of the Ministry of Munitions has been Deputy Director-General of the Ministry and Technical Director of the Optical Department of the Ministry. He is the present president of the Optical Society. It is expected that, subject to the conclusion of certain arrangements with the Treasury, Mr. Cheshire will accept the directorship, and it is anticipated that the organisation of the department will be rapidly completed, and that training will begin at an early date.

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## THE CONFIGURATIONS OF ASTRONOMICAL MASSES AND THE FIGURE OF THE EARTH.[1]

A STUDY of the forms which can be assumed by masses of actual compressible matter under their own gravitation is of obvious importance for cosmogony and astronomy. A theorem of fundamental importance is that for a given mass, acted on by given forces and rotating at a given speed, there is only one equilibrium arrangement of the internal strata when the boundary is fixed. Thus possible figures of equilibrium can be classified by their boundaries; the interior matter will arrange itself.

A simple application is to the figure of the earth. Regarding the earth's surface as roughly spherical, the internal layers of equal density must be concentric spheres. The view that the internal strata may be, or in some past age may have been, excentric, is found to be illusory, and an attempted explanation of the major inequalities of the earth's surface in terms of this idea fails.

A more complex application is to the figures of compressible masses, such as gases, in rotation. It is found that a shrinking compressible mass will, in general, assume in turn figures which may be described as pseudo-spheroids and pseudo-ellipsoids, these being derived by continuous distortion from the spheroids and ellipsoids which form the only stable figures of equilibrium for incompressible masses. The pseudo-spheroids are more lens-shaped than a spheroid, and the pseudo-ellipsoids are more spindle-shaped than an ellipsoid. A sharp periphery may develop on the pseudo-spheroid or a sharp point on the pseudo-ellipsoid, in which case streams of matter are ejected through centrifugal force outbalancing gravity.

Considering in detail the figures appropriate to the law $p=\kappa\rho^{\gamma}$, it is found that a sharp periphery will develop on the pseudo-spheroids before the series of pseudo-ellipsoids is reached, if $\gamma<3$ (approximately). Thus a mass of ideal gas for which $\gamma<1\frac{2}{3}$ can never attain the pseudo-ellipsoidal form and so can never divide into two detached masses. But as the density of an actual gas increases with shrinkage, the ideal laws are departed from. The value $\gamma=3$ is reached, perhaps, at a density of $\frac{1}{4}$ to $\frac{1}{2}$, roughly that of a B-type star. So far, then, a "giant" star can lose matter equatorially, but cannot divide by fission. The

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[1] Abstract of the Bakerian Lecture delivered before the Royal Society on May 17 by Mr. J. H. Jeans, F.R.S.

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